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the Cincinnati group, the inference is just, that the markings from the latter had their origin under the same conditions. There is no reason for supposing that the Cincinnati Island was not subject to elevations and depressions alternately. The evidence here given, showing the presence of three former shore-lines, seems conclusive. Probably, were other localities and other groups examined in a similar manner, similar facts would be found.

JOSEPH F. JAMES.

HUDSON-BAY ESKIMO.

IN the report of the Hudson-Bay exploring expedition, it is stated that the only inhabitants of Hudson Strait and the northern part of the bay are the Eskimo, who have become quite familiar with the ways of civilization. The families are small, mothers having rarely more than two or three children, which, in consequence of the absence of farinaceous food, are suckled till three or four years of age. The number of Eskimo appears to be diminishing, as there are abundant traces of their former presence in force. About six miles south of Port Burwell are the remains of a large settlement, with subterranean dwellings, in a fair state of preservation, where remains of stone pots and implements are mixed with those of more modern date. At Port De Boucherville distinct remains of a very ancient Eskimo camp, in the form of heaps and circles of stones, are found on a raised beach at the head of what had been a cove when the sea-level was about thirty feet higher than at present. At another place in the same vicinity are more modern remains, consisting of rings of tent-stones, several rectangular walls a few feet high, and *caches* of a beehive form about six feet in height, such as are now used for storing meat, or as hiding-places from which to kill game. Around Port Laperrière, also, camping-places are found, which, from their elevation above the sea-beach, the decayed nature of the larger bones lying about, and the manner in which the circles of stones are embedded in moss and overgrown with lichens, must be from one hundred to three hundred years old. Still more ancient Eskimo works are discovered in the valley which comes down to the head of the harbor. These consist of a row of stones running athwart the brook at a contracted part of the valley, which would be suitable for the Eskimo method of trout-fishing if the sea were eighty feet higher than it is at present.

Along the Labrador coast the Eskimo gather in small settlements round the Moravian mission-stations; Nain, with a population of about two hundred, being the largest. Here they are educated, and the missions are self-supporting; the missionaries supplying the Eskimo, purchasing their catch and shipping it to London, and communicating with Newfoundland during the summer by a mail-steamer which makes occasional trips as far as Nain. Lieut. Gordon gives the Eskimo the highest character for honesty and docility.

PHYSICS IN THE SCHOOLS.

PROFESSOR WEAD has published the replies to a circular distributed by the commissioner of education, Mr. John Eaton, in regard to the best method of teaching physics in the secondary schools. The general impression obtained from these replies, which are from high-school teachers as well as from college professors, is that a certain amount of laboratory work in physics is desirable. Very few, however, of the teachers who have replied, can apparently speak from actual experience of the advantages of the laboratory method. Within a quarter of a century there has been a marked change in the views of those who have entered upon chairs of physics in our various colleges. The earlier professors of so-called natural philosophy looked at their subject from a semi-literary point of view, and did not descend into the laborious arena of the laboratory, where their half-brothers the chemists had long preceded them. To-day there are physicists who laugh at the old method of teaching physics; and, although we are somewhat conservative, we also are tempted to indulge in a sly laugh in our sleeve.

The problem of the best method of teaching physics in the secondary schools, however, can only be a faint reflection of the methods adopted in the universities. We are inclined to believe that it should aim to be a faint reflection, — popular lectures for stimulating the imagination of the boy, and rough experiments for the masses, in order to train the scientific instinct and the powers of observation.

The report contains valuable information in regard to the teaching of physics in England, Germany, and France. The general impression gained from this report is that the new methods of teaching physics have not been adopted in a large enough number of cases to warrant any conclusions from a study of those cases. The training of teachers is steadily improving, and every year our colleges and universities send out men imbued with modern methods of laboratory instruction. These men must have a marked influence on the future methods of teaching physics.

HALLUCINATIONS.

WHEN a patient is hypnotized, he imagines that he sees all things as they are suggested to him, provided he is a healthy subject. But in these hallucinations a person who has lost the chromatic sensibility cannot be made to see suggested colors to which he is naturally blind. If the achromatopsy be limited to one side, the left for instance, and the hypnotized subject has the right eye closed, he obstinately affirms that he does not see the suggested color, and cannot be made to see it until the right eye is opened.

There is a second thing which shows, better than the preceding, that hallucination and sensation have the same cerebral origin: it is the property which hallucinatory images have of provoking the same

Abstract of an article by BINET and FÉRÉ in the *Revue scientifique*.

effects of contrast as of sensation. Take a card, white on one side, and half green and half white on the other, with a dot in the centre of each side, to hold the attention. Look steadily at the green-and-white side for a minute, then turn the card, and the half corresponding to the green will have a red tint, and the other half will have a complementary green tint. The consecutive red image has developed, by induction, the green sensation in a part of the eye which had been impressed only by white. The same results are obtained if the subject be hypnotized. The experiment will fail if the subject is blind to the suggested color. If a subject is blind to a certain color, a peculiar case results. On giving him the hallucination of green, the sensation of red cannot be induced; but in giving the hallucination of red, which he can see, the induced sensation of green (to which he is blind) is produced.

The production of consecutive images is a normal phenomenon: so, in all hallucinations which last a certain time, a consecutive image follows. If one causes a patient in a hypnotized state to look at a square of white paper with a point in the centre, suggests that the square is red, and then suddenly presents a second similar square, the subject will say that the point is surrounded by a colored square, and the color will always be the complementary of the one suggested. This complementary color is the negative image left by the hallucination. It lasts only a short time, then becomes effaced. That similar phenomena are observed in the normal condition, may be proved by the following: if, with the eyes shut, we keep the image of a bright color in our mind a long time, then open them suddenly, looking upon a white surface, we will then see for a short time the image we were contemplating, but of a complementary color.

The following most curious experiment upon the mixture of imaginary colors helps to prove the same thing. Place two squares of differently colored paper at some distance upon a table; then place before the eye a plate of glass inclined in such a manner that the whole of one card can be seen directly, and at the same time a reflected image of the second. One can very readily cause the two papers to superpose, and become mixed. If we show a hypnotized patient the same thing, substituting blank cards, and suggesting colors for each card, they will appear mixed to him in the same manner. The necessary conclusion from this seems to be, that hallucination of a color is a suggested sensation, having the same cerebral seat as the real sensation.

THE OYSTER-FISHERY IN CONNECTICUT.

THE fourth annual report of the shell-fish commissioners of the state of Connecticut was recently issued, and contains, in concise form, much useful information. In its record of benefits accrued to the state by its system of ownership and moderate taxation of oyster-planting grounds, it offers great encouragement to those who would institute in each state systematic business methods in connection with

this one of the most important of all our fishery interests. We have before referred to the system adopted by the commission in mapping and determining permanent bounds for the natural beds and ground available for planting. The survey of the natural beds, which are open to all oystermen under certain restrictions, has been completed. They comprise 5,805 acres. The total area of planting-grounds, designated for occupancy by the commission since its organization, is 45,046 acres, which have netted to the state \$49,560. Adding to this the area previously designated by the seaside towns, and we have over 79,018 acres now under the control of individuals, of which 14,066 acres are under cultivation.

The total number of tax-paying cultivators in 1884 was 385, of whom 16 own each five acres or less, 53 between five and twenty acres each, and 332 own twenty acres or more each. The amount of tax levied, averaging ten cents per acre, was about \$6,500, of which less than \$50 are delinquent. This is trifling in comparison with the local taxation of grounds under town jurisdiction. Eleven hundred acres of grounds in the state of Rhode Island pay a tax or rent of a hundred dollars per acre to that state. The Connecticut commission has not valued grounds for taxation in excess of fifty dollars per acre, though lands have been reported sold during the year at from two to six times that amount. It is obvious, therefore, that the encouragement given by the state to those employed in this business is very great. The business is steadily growing. There are already over three hundred sailing-vessels and forty steamers employed, the latter with an aggregate capacity of 36,720 bushels; and several more steamers are being constructed. The first steamer was employed less than ten years ago.

There has been a very considerable increase in the sale of seed oysters and stock to neighboring states, and also in the exportation to Great Britain. Oysters for export are packed in barrels containing 950 four-year-olds, or 1,500 three-year-olds, the deep valve down and pressed very solid. One firm, exporting 10,000 barrels a year, has never lost a bushel by long passage, bad weather, or other causes. Many are shipped to California also. Accurate statistics are not available, as the oystermen seem to resent inquiries as an interference with their private business. In the course of time they will probably know their own interests better.

The chief injury sustained in the business is from star-fishes, which destroy the young oysters. It is estimated that over fifty thousand bushels of stars were destroyed last year. They are most destructive in the cooler weather. In July and August they form into great bunches or rolls for spawning, and lie quiet. In some localities there were few or none, in others such multitudes as had not been seen for many years. It has been suggested that the state should pay a small bounty for them; and, as they are worth something as a fertilizer, the sale would partly reimburse the outlay. The receipts of the commission were \$13,731.84; the disbursements, \$8,350.49.